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(54) System and method for providing automated message notification in a wireless communication system

(57) A system and method are provided for automatically notifying a user of an awaiting message. A wireless communication system including an identification means is utilized. The identification means identifies a registered user of the wireless communication system. A mail notification system is used for notifying the registered user of an awaiting message. A communication means checks for awaiting messages for the identified registered user. If an awaiting message is present, the communication means triggers the mail notification system.

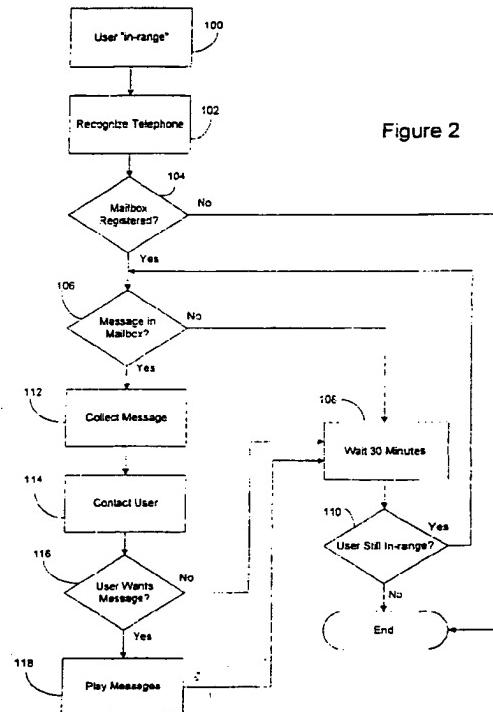


Figure 2

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Description

The invention relates to connecting a messaging system with a wireless communication system, and more particularly to a system and a method for automatically notifying a user of an awaiting message in a wireless communication environment.

Messaging systems are common in both public and private areas. For example, voice mail messaging systems are located in almost every office environment and in many private homes. Public and private wireless systems which include cellular telephones are also common. When a cellular telephone user subscribes to a messaging system, such as voice mail, from their cellular carrier, the user must periodically check for messages in that user's message mailbox. This checking is done manually by placing telephone calls. Similarly, a user who is away from the office and/or home and awaiting some message(s) must periodically check for messages in the office and/or home message mailbox(es). This is usually done by calling the office voice mail system or the home voice mail system. An office voice mail system may be connected to a PBX (private branch exchange), and a home voice mail system may be connected to a central office. Thus, both of these systems can be accessed with a telephone call from a user. In these situations, the messaging systems rely on users to remember to check their message mailbox(es).

Outcalling is available in some voice mail systems. Systems with outcalling can be programmed to call a given number when a message is received, but this is not helpful in a wireless communication environment because the cellular telephone can be out of range or turned off.

Enhanced one-number services are available to allow a single cellular telephone to operate with multiple systems. In this arrangement, all telephone calls are transferred to (or follow) a single cellular telephone. While enhanced one-number services transfer calls to a single cellular telephone, they do not transfer waiting messages.

In public wireless systems, it is desirable to reduce air time usage, and therefore reduce air time charges, and in private wireless systems, it is desirable to reduce congestion on an internal network and to improve usability. Finally, a system which provides simplified mobile message notification and reception is desirable.

A system for automatically notifying a user of a waiting message in accordance with the invention, has the features specified in claim 1.

A method for automatically notifying a user of a waiting message in accordance with the invention, has the features specified in claim 10.

Advantageously, whether the user can be contacted by the wireless communications system is determined on the basis of the detection by the communications system of a user registered identification number when, for example, a cellular telephone is in range of a base sta-

tion and is not switched off. This determination is carried out within the normal operation of the communications system, and therefore this step does not cause an additional computational burden.

- 5 According to an embodiment of the invention, a system and method for automatically notifying a user of an awaiting message are provided. A wireless communication system including an identification means is utilized. The identification means identifies a registered user of the wireless communication system. A mail notification system is used for notifying the registered user of a waiting message. A communication means checks for waiting messages for the identified registered user. If a waiting message is present, the communication means triggers the mail notification system.
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For a better understanding of the present invention, and to show how it may be brought into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

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- Figure 1 illustrates an example of a communication environment for one embodiment of the present invention; and
- Figure 2 is a process flow chart for an embodiment of the present invention.

The present invention provides for automatically notifying a user of an awaiting message and for playing that message for the user in a wireless communication environment. This invention applies to any type of multimedia message (e.g., voice message, e-mail message, video message, facsimile message, etc.). In the detailed description below, the present invention is applied to voice messages (or voice mail).

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- Figure 1 illustrates an example of a communication environment for one embodiment of the present invention. In the preferred embodiment, the present invention checks for an awaiting message(s) whenever a user 10 with activated cellular telephone 12 moves into an "in-range" area 20 of a remote wireless base station 22. Wireless provider/carrier base station 22 includes a transmitter and a receiver for wireless communication. Wireless communication provider/carrier system 30 is then contacted by wireless base station 22. Wireless base station 22 provides wireless communication system 30 with the registration identification number assigned to cellular telephone 12. Either wireless base station 22 or wireless communication system 30 performs a check on the cellular telephone's registration identification number. These checks are normally done to confirm that cellular telephone 12 has a valid account (e.g., owned by a legitimate, registered user).

- Wireless communication system 30 then uses the registration identification number to check its message mail registration table 32 and to determine if user 10 has an associated mailbox(es) 34. Hence, wireless communication system 30 uses the cellular telephone identification number to associate cellular telephone 12 with a

particular message mailbox 34, or with multiple message mailboxes 34, 42, 52. In one embodiment of the present invention, multiple message mailboxes 34, 42, 52 are checked for awaiting messages. When an awaiting message is present in any of multiple message mailboxes 34, 42, 52, the user is automatically contacted. The messages from all of these multiple messaging systems can then be transferred to the user. For example, message mailbox 34 is attached to the cellular network and provided by wireless communication system 30. Additionally, user 10 may have land-based message mailbox 42 through a PBX message system 44 located at the user's office 40 and another land-based message mailbox 52 through a central office 50 which provides messaging services to user's home system 60.

After associated message mailboxes 34, 42, 52 are found, wireless communication system 30 sends a query to message mailboxes 34, 42, 52 to determine if any awaiting messages are present. If there are messages present, wireless communication system 30 notifies the user of the awaiting messages. This notification can be done, for example, by sending a message for display on cellular telephone 12 or by placing a telephone call to cellular telephone 12. If a telephone call is placed to cellular telephone 12, user 10 can be offered the option of connecting to the message mailbox(es) with awaiting messages immediately.

After a user is "in-range" of wireless base station 22, wireless communication system 30 can continue to provide this service by either regularly polling the messaging system(s), or by having the messaging system(s) notify it if any new messages for user 10 arrive. If regular polling is used, wireless communication system 30 contacts messaging systems 34, 42, 52 after a predetermined waiting period. This contacting, waiting and then contacting again continues until user 10 leaves area 20 or cellular telephone 12 is turned off.

In another embodiment of the present invention, the messaging system is used to contact the user. Once the messaging system is notified by the wireless communication provider that a user is "in-range," the messaging system could place a telephone call to the user for notification purposes. The messaging system could then play the message for the user, if desired.

Figure 2 is a process flow chart for an embodiment of the present invention. At step 100, a user with an activated cellular telephone arrives in an area covered by a wireless base station. At step 102, the system recognizes the user's cellular telephone. Standard registration techniques are used for recognizing the cellular telephone. At step 104, the system checks for message mailbox registration. If no mailboxes are registered for that user, the process ends. If a mailbox (or mailboxes) is registered, the system moves on to step 106. At step 106, the system queries the registered message mailbox(es). If no messages are present, the system waits a predetermined amount of time (e.g., 30 minutes) at step 108. At step 110, the system checks if the user is

still "in-range." If the user is out-of-range, the process ends. Also, if the cellular telephone is turned off, the process ends. If the user is in-range, the system returns to step 106. The system checks again for messages at step 106. If messages are waiting for the user, the system collects the message(s) at step 112. Step 112 is optional. For example, if the user's messaging system(s) is used to contact the user about awaiting messages, the system does not need to collect the message(s).

At step 114, the user is contacted regarding the awaiting message(s). This contacting can be done by either the wireless communication provider or each of the user's messaging systems. As stated above, this contacting can be done by providing information on the display of the user's cellular telephone or by calling the user's cellular telephone. If information is provided on the display of the cellular telephone, this information can include which of the user's messaging systems contains the awaiting message. Thus, the user could then directly call the appropriate messaging system. At step 116, the system determines if the user wants to play the awaiting message(s). This can be done by the user, for example, by entering a code into the user's cellular telephone or by answering prompts provided by the telephone call which notifies the user of the awaiting messages. If the user wants to play the awaiting message(s), the system plays the messages at step 118. This is done by either playing the collected messages or by connecting the user to the messaging system which contains the awaiting message. The system waits a predetermined amount of time at step 108. The system then checks if the user is still in-range at step 110. If the user is still in range, the system returns to step 106 and checks for messages. If the user does not want to play the awaiting message(s), the system moves directly to step 108 and waits.

The user can interact with the present system. For example, by calling a special telephone number or by entering a code into the cellular telephone, the user can disable the present system or change the parameters of the present system. To change the parameters, the user could, for example, change the predetermined amount of time the system waits before rechecking for messages. In the preferred embodiment, the process shown in Figure 2 continues until the user is out-of-range or the cellular telephone is turned off. Also, the process shown in Figure 2 repeats itself whenever a user comes in-range of a wireless base station. Therefore, the system follows the user from station to station.

The present invention can be applied in an in-building wireless system. For example, some offices have wireless systems which allow their employees to move inside buildings or around campuses (i.e., clusters of buildings in close proximity) while remaining connected to their PBX or central office with a wireless connector. With the present invention, users within a building or campus area would be treated as though they were in-range of a wireless base station. Furthermore, these in-building wireless systems are often limited in channel

capacity such that application of the present invention would dramatically reduce congestion.

The present invention provides numerous advantages. For example, by providing for automatic contact when an awaiting message is present, the user makes fewer telephone calls. This occurs because the user does not need to periodically check for awaiting messages. The periodic polling of multiple messaging systems can result in many unnecessary telephone calls. In public wireless systems, air time usage is reduced. Thus, air time charges are reduced. Similarly, in private wireless systems, congestion on the internal network is reduced and usability is improved. Additionally, enhanced security is provided by the present invention. This occurs because the cellular telephone's hardware registration identification number can be used as an added requirement for accessing a user's message(s). The user's password could be eliminated, but in the preferred embodiment, both the registration identification number and the user's password are required for access to awaiting message(s).

Claims

1. A system for automatically notifying a user of a wireless communication system (12, 22, 30) of a waiting message, characterised in that the system comprises: means for determining that it is possible to contact a user (10) by means of the wireless communications system (12, 22, 30); means for determining whether messages are waiting for the identified user; and notification means for notifying the user of a waiting message, arranged such that the user is notified that a message is waiting when the user (10) can be contacted by means of the wireless communications system (12, 22, 30).
2. The system for automatically notifying a user of a waiting message, as claimed in claim 1, wherein the means for determining whether messages are waiting for the identified user checks for waiting messages from multiple mailboxes (34, 42, 52).
3. The system for automatically notifying a user of a waiting message, as claimed in claim 2, wherein each of the multiple mailboxes (34, 42, 52) is checked on a periodic basis.
4. The system for automatically notifying a user of a waiting message as claimed in any preceding claim, wherein the notification means is a voice mail notification system.
5. The system for automatically notifying a user of a waiting message as claimed in any preceding claim, wherein the notification means connects the user with a mail box (34, 42, 52) containing the waiting message.
6. The system for automatically notifying a user of a waiting message as claimed in any preceding claim, wherein the notification means collects the waiting message and gives the user (10) the option of receiving the waiting message.
7. The system for automatically notifying a user of a waiting message as claimed in claim 6, wherein the user is identified by means of a registration number, and both the registration number and a password are needed for reception of the waiting message.
8. The system for automatically notifying a user of a waiting message as claimed in any preceding claim, wherein the user can interact with the system and disable the system.
9. The system for automatically notifying a user of a waiting message as claimed in any preceding claim, wherein a telephone call is placed to the user to notify the user of the waiting message.
10. A method for automatically notifying a user of a wireless communications system of a waiting message, characterised in that the method comprises the steps of:
determining whether it is possible to contact a user by means of the wireless communications system; and
contacting the user with information related to a waiting message if a message is present in a mailbox associated with the user when it is possible to contact the user by means of the wireless communications system.
11. The method for automatically notifying a user of a waiting message as claimed in claim 10, further comprising the step of collecting the waiting message if the waiting message is present.
12. The method for automatically notifying a user of a waiting message as claimed in claim 11, further comprising the step of playing the collected messages for the user.
13. The method for automatically notifying a user of a waiting message as claimed in one of claims 10-12, wherein once it has been determined that it is possible to contact a user by means of the wireless communications system, the steps of determining whether a message is present in a mail box associated with the user, and of contacting the user with information related to a waiting message if a message is present in a mail box associated with the user, are repeated periodically until it is no longer

possible to contact the user by means of the wireless communications system.

14. The method for automatically notifying a user of a waiting message as claimed in one of claims 10-13, wherein a mail box registration table is used when checking for the mail box. 5
15. The method for automatically notifying a user of a waiting message as claimed in one of claims 10-14, further comprising the step of connecting the user to the mail box with the waiting message. 10
16. The method for automatically notifying a user of a waiting message as claimed in one of claims 10-15, wherein the user is contacted by placing a telephone call to a cellular telephone. 15
17. The method for automatically notifying a user of a waiting message as claimed in one of claims 10-16, wherein the messages are voice mail messages. 20

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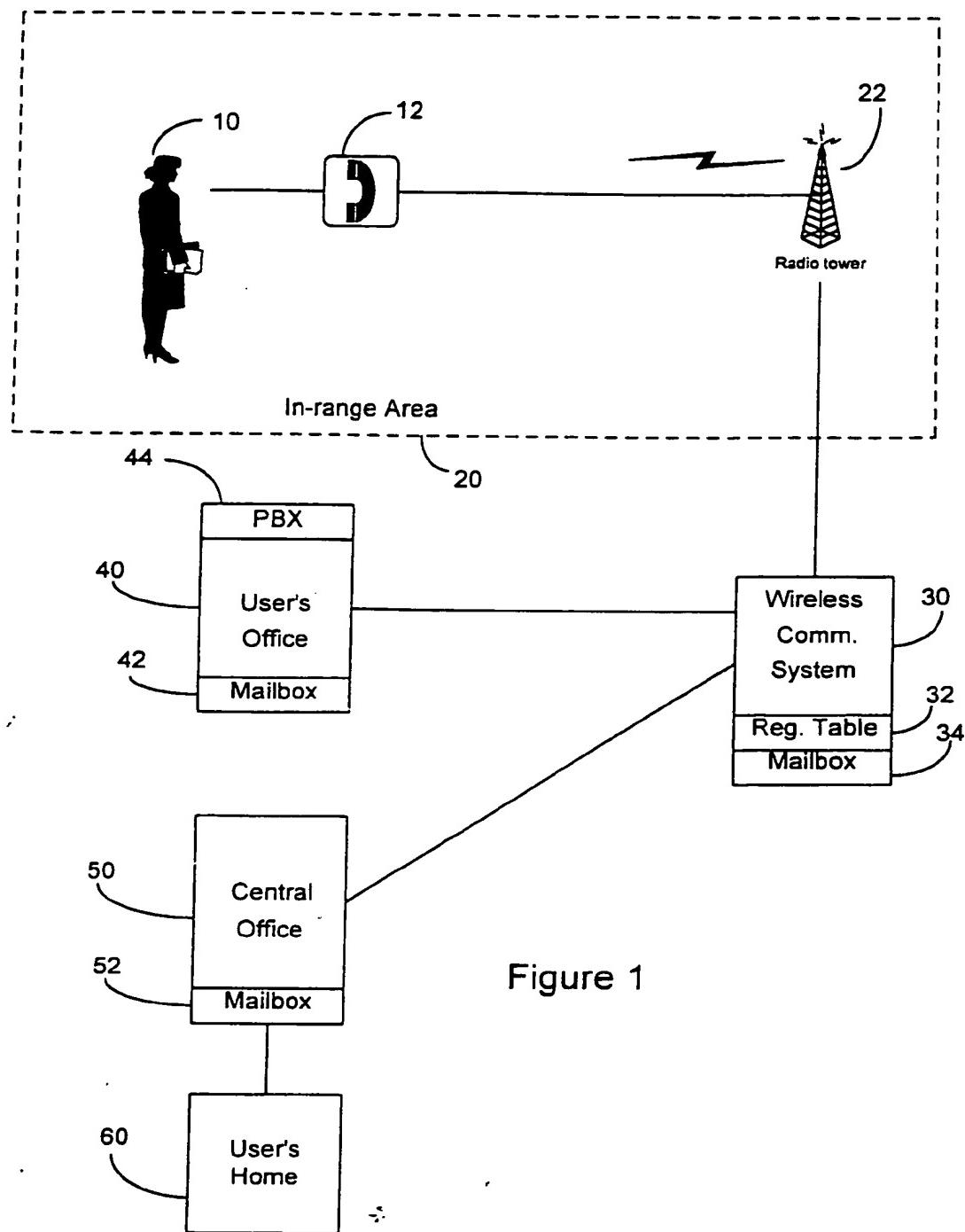


Figure 1

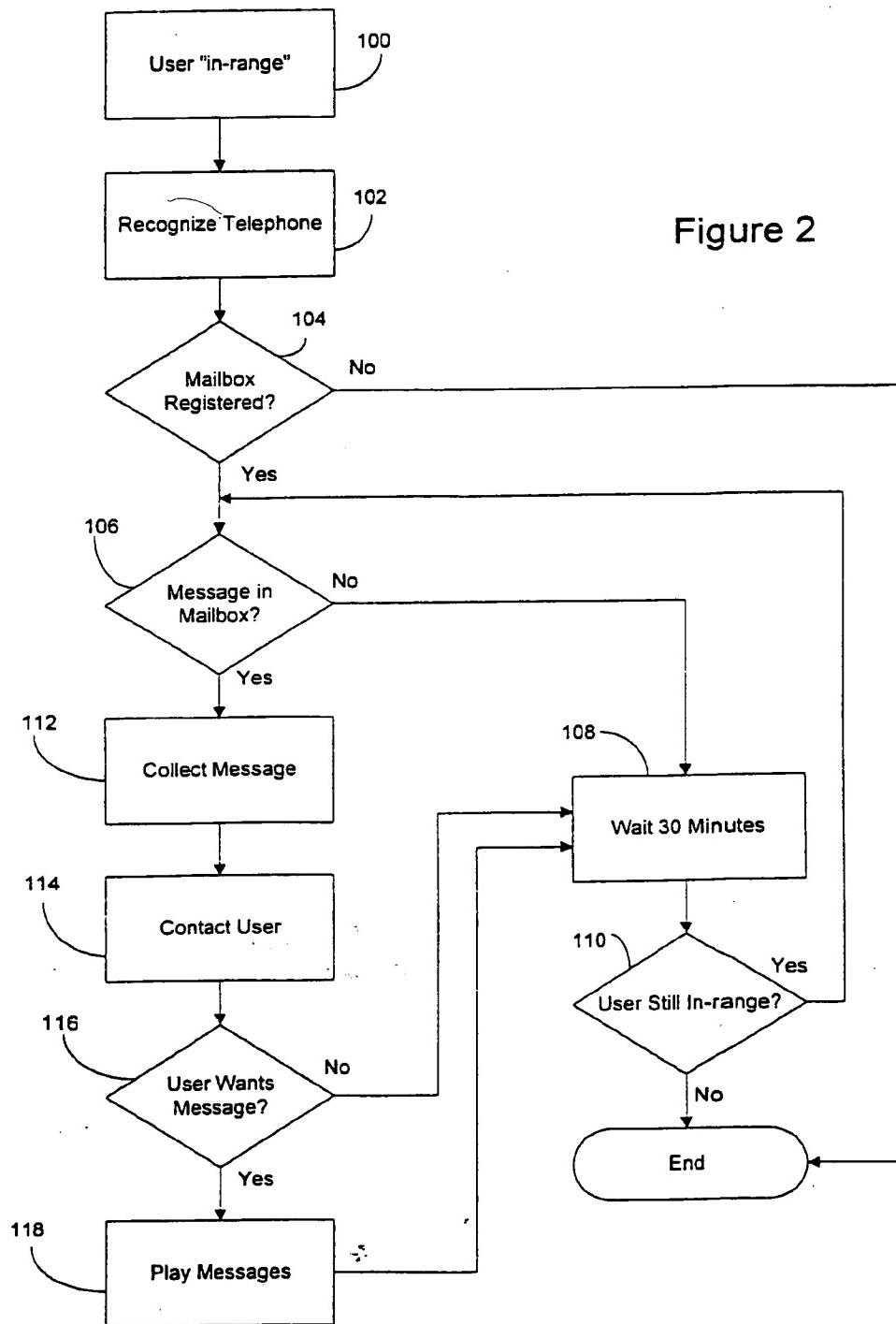


Figure 2

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